OFFICE OF RIVER PROTECTION
P.O. Box 450, MSIN H6-60
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MAR 3 1 2017

17-ECD-0019

Ms. Alexandra K. Smith, Program Manager
Nuclear Waste Program
Washington State
Department of Ecology
3100 Port of Benton Blvd.
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Ms. Smith:

U.S. DEPARTMENT OF ENERGY, OFFICE OF RIVER PROTECTION SUBMITS TOC-ENV-NOC-5269, REV. 00, CRITERIA AND TOXICS AIR EMISSIONS NOTICE OF CONSTRUCTION FOR THE VENTILATION SYSTEM AT THE HANFORD SITE LABORATORY, 222-SL

The U.S. Department of Energy, Office of River Protection submits for review and approval the notice of construction (NOC) application TOC-ENV-NOC-5269, "Criteria and Toxics Air Emissions Notice of Construction for the Ventilation System at the Hanford Site Laboratory, 222-SL" (Attachment 1).

This NOC application proposes constructing and operating the 222-SL Laboratory which will be located within the 222-S Laboratory Complex within the 200 West Area of the Hanford Site. The 222-SL Laboratory will be a non-radiological laboratory building. A toxic air pollutant list for 222-SL is included in this NOC application to support proposed monitoring.

If you have any questions, please contact Dennis W. Bowser, Environmental Compliance Division, (509) 373-2566.

Kevin W. Smith
Manager

ECD:DWB

Attachments:
1. Document Release and Change Form
2. Notice of Construction Application
3. Notification of Off-Permit Change

cc: See page 2

cc w/attachs:
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Attachment 1
17-ECD-0019
(31 Pages Excluding Cover Sheet)

Document Release and Change Form
Criteria and Toxics Air Emissions Notice of Construction for the Ventilation System at the Hanford Site Laboratory, 222-SL

TOC-ENV-NOC-5269, Rev. 0

Criteria and Toxics Air Emissions Notice of Construction for the Ventilation System at the Hanford Site Laboratory, 222-SL

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U.S. Department of Energy Contract DE-AC27-08RV14800

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Key Words: 222-SL, NOC, notice of construction, emissions estimate, criteria pollutants, toxic air pollutants, TAP

Abstract: This document is a notice of construction application for the 222-SL Laboratory. The 222-SL Laboratory will support the Hanford Site by performing non-radiological functions such as standards and reagents preparation, chemical storage, sample media storage, and industrial hygiene sample receipt facility.

Criteria and Toxics Air Emissions Notice of Construction for the Ventilation System at the Hanford Site Laboratory, 222-SL

Prepared by:
Washington River Protection Solutions LLC

Date Published
March 2017

Prepared for:

United States Department of Energy
Office of River Protection
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Richland, Washington

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EXECUTIVE SUMMARY

This document serves as a notice of construction application pursuant to the requirements of *Washington Administrative Code* 173-400, "General Regulations for Air Pollution Sources," and *Washington Administrative Code* 173-460, "Controls for New Sources of Toxic Air Pollutants," for the operation of the ventilation system at the planned non-radiological 222-SL Laboratory.

The proposed 222-SL Laboratory will support the existing Hanford Site 222-S Laboratory by performing non-radiological functions such as standards and reagents preparation, chemical storage, sample media storage, and industrial hygiene sample receipt facility. In addition, mercury and ammonia analyses, dimethyl mercury tube drying, headspace sample media preparation, organic vapor analyses, and vapor analyses method development, will take place in the 222-SL Laboratory. Other potential laboratory activities include analytical method development, special studies, viscosity testing, and supplemental technology simulant testing.

The 222-SL Laboratory is a non-radiological laboratory that will support all Hanford Site programs, including, but not limited to, Industrial Hygiene, Toxic Vapor Assessment Team, Environmental Programs, Treated Effluent Disposal Facility/Effluent Treatment Facility, Retrieval and Closure, Direct Feed Low Activity Waste, and Waste Treatment and Immobilization Plant.

Potential emissions of toxic air pollutants for the 222-SL Laboratory ventilation system were calculated and 124 toxics were found to potentially be emitted. Of the 124 toxics identified, dimethyl mercury and n-nitrosodimethylamine were found to be above the *Washington Administrative Code* 173-460 de minimis level. Dimethyl mercury was calculated to exceed the small quantity emissions rate and acceptable source impact screening levels. It is proposed that RPP-ENV-59016, "Second Tier Review Petition for Hanford Tank Farm and Waste Treatment Plant Dimethyl Mercury Emissions," be used to satisfy *Washington Administrative Code* 173-460-090, "Second Tier Review," requirements for dimethyl mercury for this notice of construction application.

This application contains the estimated emissions for toxic air pollutants. As a non-radiological laboratory, a Radiological Air Emissions License per 40 *Code of Federal Regulations* 61, subpart A and subpart H is not required.

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LIST OF TERMS

AERMOD	American Meteorological Society/U.S. Environmental Protection Agency Regulatory Model
ASIL	acceptable source impact level
BACT	best available control technology
CAS	Chemical Abstracts Service
DOE	U.S. Department of Energy
DST	double-shell tank
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
GC/MS	gas chromatography/mass spectrometry
NOC	notice of construction
RCW	*Revised Code of Washington*
SEPA	State Environmental Policy Act
SQER	small quantity emission rate
SST	single-shell tank
SWIHD	Site Wide Industrial Hygiene Database
TAP	toxic air pollutant
tBACT	best available control technology for toxics
TWINS	Tank Waste Information Network System
VOC	volatile organic compound
WAC	*Washington Administrative Code*

UNITS

%	percent
cfm	cubic feet per minute
ft^2	square foot
g/s	grams per second
gal	gallons
m	meter
scfm	standard cubic feet per minute
$\mu g/m^3$	microgram per cubic meter

1.0 INTRODUCTION

This document serves as a notice of construction (NOC) application pursuant to the requirements of *Washington Administrative Code* (WAC) 173-400, "General Regulations for Air Pollution Sources," and WAC 173-460, "Controls for New Sources of Toxic Air Pollutants," for the operation of the ventilation system at the non-radiological 222-SL Laboratory. This application contains the estimated emissions for toxic air pollutants (TAP) and criteria pollutants.

The evaluation of best available control technology for toxics (tBACT) is provided in Section 9.0. Based upon the results of this tBACT, the proposed tBACT control technology for the 222-SL ventilation system is a standard laboratory ventilation system with monitoring of toxic air pollutants exceeding the de minimis screening levels in order to confirm that actual emissions are within allowable limits.

1.1 Project Scope

The proposed project will include constructing and operating the 222-SL Laboratory which will be located within the 222-S Laboratory Complex within the 200 West Area of the Hanford Site. The 222-SL Laboratory will be an approximately 9300 ft^2 non-radiological laboratory building. The 222-SL Laboratory will support the existing 222-S Laboratory and provide for additional non-radiological work as described in Section 3.2. The 222-SL Laboratory design includes an exhaust system as described in Section 8.0.

1.2 Summary of Emissions Estimates

The potential for emissions of TAPs from the 222-SL Laboratory was calculated and 124 toxics were found to potentially be emitted. These emissions are expected to originate from the analyses of tank headspace samples from double-shell tank (DST) or single-shell tank (SST) tanks and from preparation and use of laboratory standards and reagents. Samples will undergo high efficiency filtration as part of the sample collection process to remove particulates. Of the 124 toxics identified, dimethyl mercury and n-nitrosodimethylamine were found to be above the (WAC) 173-460 de minimis levels. Dimethyl mercury exceeded the small quantity emission rate (SQER) and acceptable source impact screening levels (ASIL). It is proposed that RPP-ENV-59016, "Second Tier Review Petition for Hanford Tank Farm and Waste Treatment Plant Dimethyl Mercury Emissions," be used to satisfy WAC 173-460-090, "Second Tier Review," requirements for dimethyl mercury for this NOC application.

Per Washington State Department of Ecology (Ecology) NOC application guidelines, the estimated emissions for criteria pollutants are included in this NOC application. Criteria pollutant emissions estimates are provided in Appendix A, Table A-1 and are below the regulatory exemption levels.

2.0 FACILITY IDENTIFICATION AND LOCATION

The Hanford Site address for the 222-SL Laboratory is:

U.S. Department of Energy, Office of River Protection
Hanford Site
200 West Area
Near Richland, Washington 99352

Table 1 provides the location of the proposed 222-SL Laboratory on the Hanford Site. A map of the Hanford Site is shown in Figure 1. The proposed facility is along the southern boundary of the 200 West Area of the Hanford Site. A map of the Hanford Site 222-S Laboratory Complex, including the 222-SL Laboratory, is provided in Figure 2.

Table 1. Coordinates of the 222-SL Laboratory.

Facility	Easting (m)	Northing (m)
222-SL	299220.4	5156771.01

Figure 1. Hanford Site Map.

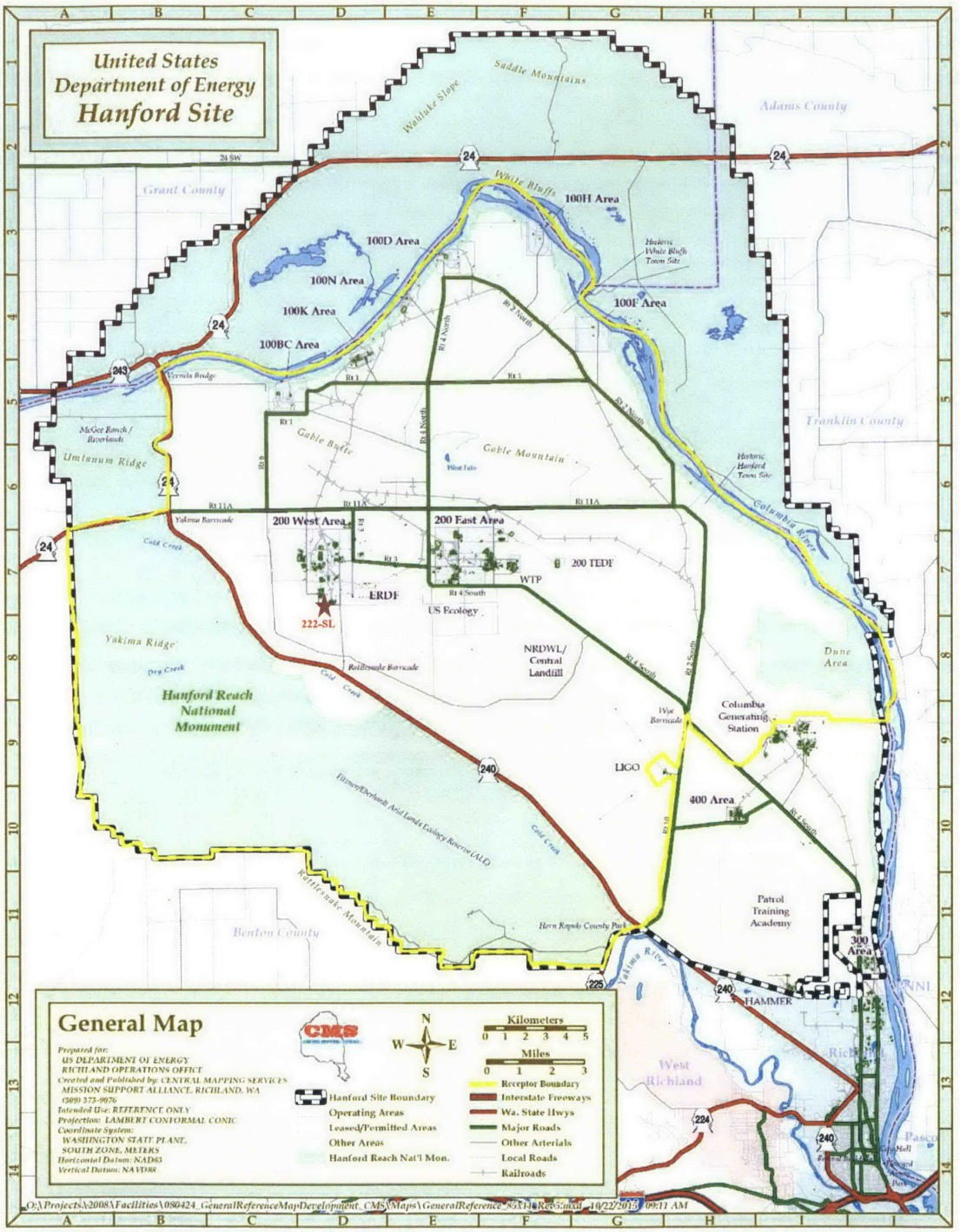


Figure 2. 222-S Hanford Site Laboratory Complex.

3.0 PROJECT BACKGROUND

The purpose of this NOC application is for approval to construct and operate the 222-SL Laboratory. The 222-SL Laboratory will house functions previously contained in the non-radiological laboratory, 222-SA. Therefore, a brief history of 222-SA is provided below.

3.1 Background

The 222-SL Laboratory is intended to provide space to perform and augment the processes previously located in the now demolished 222-SA Laboratory. The 222-SA Laboratory was constructed in 1980 and was used for reagent receipt and storage, preparation of standards and reagents, and testing of non-radiological analytical techniques. The 222-SA Laboratory had exceeded its design life and was demolished in 2016. The processes conducted in the 222-SA Laboratory were temporarily moved into the 222-S Laboratory building. The 222-SL Laboratory will be constructed on the same general footprint of the 222-SA Laboratory.

3.2 Purpose of 222-SL Laboratory

The 222-SL Laboratory will support and complement the capabilities of the existing 222-S Laboratory. Processes previously performed in 222-SA Laboratory will be performed in 222-SL Laboratory, as well as providing for additional laboratory capabilities. The 222-SL Laboratory is an approximately 9300 ft^2 laboratory building which will replace and augment the non-radiological capabilities of the 222-SA Laboratory.

The 222-SL Laboratory will provide space to conduct non-radioactive laboratory activities such as process chemistry, organics analyses, Industrial Health analyses, and standards laboratory functions. See Section 7 for further discussion of these activities and the potential emissions associated with them.

The 222-SL Laboratory will support all Hanford Site programs, including, but not limited to, Industrial Hygiene, Toxic Vapor Assessment Team, Environmental Programs, Treated Effluent Disposal Facility/Effluent Treatment Facility, Retrieval and Closure, Direct Feed Low Activity Waste, and Waste Treatment and Immobilization Plant. The samples will not be radiologically contaminated. Tank headspace samples will undergo high efficiency filtration as part of the sample collection process to remove particulates. Samples will be screened for radiological contamination prior to delivery to the 222-SL Laboratory.

4.0 RESPONSIBLE MANAGER

The current responsible facility manager is:

Kevin Smith, Manager
U.S. Department of Energy
Office of River Protection
P.O. Box 550
Richland, Washington 99352

Phone: (509) 372-2315

5.0 PROPOSED ACTION

This NOC application is submitted for approval for the construction and operation of the 222-SL Laboratory which will support current and future laboratory operations needed for the Hanford Site mission.

6.0 STATE ENVIRONMENTAL POLICY ACT

This project fulfills the requirements of WAC 197-11 and *Revised Code of Washington* (RCW) 43.21C.030, "Guidelines for state agencies, local governments – Statements –Reports – Advice –Information," per RCW 43.21C.150, "RCW 43.21C.030(2)(c) inapplicable when statement previously prepared pursuant to national environmental policy act." which states, "*The requirements of RCW 43.21C.030(2)(c) pertaining to the preparation of a detailed statement by branches of government shall not apply when an adequate detailed statement has been previously prepared pursuant to the national environmental policy act of 1969, in which event said prepared statement may be utilized in lieu of a separately prepared statement under RCW 43.21C.030(2)(c).*" The document that meets the agencies review needs for the current proposal is:

> DOE/EIS-0391, "Final Tank Closure and Waste Management Environmental Impact Statement for the Hanford Site, Richland, Washington," Volume 2, Book 2, Appendix E.1.1.1, Operations and Maintenance.

The lead agency is the Office of River Protection, U.S. Department of Energy, and the contact person is Mary Beth Burandt, Document Manager and her phone number is (509) 372-8828.

7.0 EMISSIONS ESTIMATES

Emissions from the 222-SL stack were calculated from two sources:

1. 222-SL Laboratory inventory and chemical usage
2. Tank Farms vapor sample analyses.

The emission source term from 222-SL Laboratory emissions is the combination of the two sources.

7.1 Assumptions

The following assumptions were made for estimating emissions for this NOC application.

- Tank Farms sample emissions estimates were determined using the highest concentration of detected TAPs from either Tank Waste Information Network System (TWINS) or the Site Wide Industrial Hygiene Database (SWIHD) databases. Only those concentrations above the detectable limit were considered and compared against the TAP list found in WAC 173-460-150.
    - For conservatism, it is assumed that the 100% of the sample will exhaust through the stack.

  - The estimated maximum quantity of laboratory samples processed in a single day is 180. The estimated maximum quantity of samples processed in a single year would be 65,700. For conservatism, the quantity of samples was increased to 66,000 per year.
  - The Tank Farms sample median volume is 4 liters for conservatism the volume of the samples was increased by a factor of 10 to 40 liters.
- The 222-SL Laboratory inventory and chemical usage were determined by combining historical annual usage data from the standards laboratory inventory and the chemical usage inventory.
  - Standards Laboratory Inventory – The high standard value (i.e., the highest concentration standard used in calibration of the equipment) was assumed to be emitted all year long. Annual usage was calculated using historical usage data average from 2009-2016.
  - Chemical Usage Inventory – Annual usage was calculated using historical usage data average from 2001-2016.
  - Volatile liquid release fraction = 0.1; non-volatile liquid release fraction = 0.001; gas release fraction = 1.
- It is assumed that all detected TAPs are present in each sample.

7.2 Estimated Emissions of Toxic Air Pollutants

The total estimated emissions of TAPs for this project are shown in Table A-2 in Appendix A. This table provides a comparison of total estimated emissions to the WAC 173-460-150 limits. Potential emissions include 124 TAPs. Of the 124 TAPs identified, dimethyl mercury and n-nitrosodimethylamine were found to be above the WAC 173-460 de minimis level. Dimethyl mercury was calculated to exceed the small quantity emissions rate and acceptable source impact screening levels. It is proposed that RPP-ENV-59016 be used to satisfy WAC 173-460-090 second tier review requirements for dimethyl mercury for this NOC application. Dispersed concentrations were calculated using the most conservative air dispersion factors, as detailed in Section 7.4. RPP-CALC-61288, "222-SL Laboratory Emissions Calculations Supporting TOC-ENV-NOC-5269, Rev. 00," provides the emissions estimate calculations for this NOC application.

7.3 Estimated Emissions of Criteria Pollutants

The annual emissions of criteria pollutants are shown in Table A-1 in Appendix A. Criteria pollutant emission estimates are below the regulatory exemption levels.

7.4 Air Dispersion Modeling

Ambient air concentrations at the Hanford Site boundary were estimated using the American Meteorological Society/U.S. Environmental Protection Agency Regulatory Model (AERMOD) dispersion model, Version 15181. EPA-454/B-03-001, *User's Guide for the AMS/EPS Regulatory Model – AERMOD*, was used as modeling guidance.

The model inputs included the physical parameters of the 222-SL stack (Table 2). The source was modeled at the minimum and maximum flow rate and was assumed to be operating continuously for the entire year to produce the worst-case air dispersion factors for this project. A dimethyl mercury emissions rate of 1.67E-10 gram per second (g/s) was used for the air dispersion modeling scenario (Table A-2).

Table 2. 222-SL Stack Parameters.

Flow Rate (scfm)	Height (m)	Stack Diameter (m)
5384 (minimum)	10.94	.43
10370 (maximum)	10.94	.60

The public access points to the site were used as the site boundaries. The surface meteorological inputs were from the Hanford Meteorological Station and the upper air data was obtained from the Spokane, Washington, National Weather Service for the years 2009 through 2013. Digital elevation model data from the U.S. Geological Survey was used for model terrain input. The regulatory default mode was used. Based on 08-02-025, "Guidance Document: First, Second, and Third Tier Review of Toxic Air Pollution Sources," (Ecology 2015), Table 3 indicates the Ecology recommended minimum receptor grid spacing.

Table 3. Ecology Recommended Receptor Grid Spacing.

Distance from Source (m)	Grid Spacing (m)
0 – 350	10
350 – 800	25
800 – 4,000	50
4,000 – 8,000	100
>8,000	200

Table 4 shows the most conservative dispersion factors for the years 2009-2013.

Table 4. Air Dispersion Factors.

Averaging Period/ Year	µg/m3 per g/s
1-hour (2012)	56.16766
24-hour (2009)	2.634731
Annual (2009)	0.11976

7.5 Estimated Ambient Concentrations Compared to WAC 173-460-150

One toxic air pollutant, dimethyl mercury, exceeded the ASIL. The dispersed dimethyl mercury concentration was modeled to be 4.4E-10 microgram per cubic meter ($\mu g/m^3$). The WAC 173-460-150 ASIL value for dimethyl mercury is 1E-99 $\mu g/m^3$. Therefore, the dimethyl mercury dispersed concentration exceeds the ASIL value. Section 7.6 proposes using RPP-ENV-59016 to satisfy second tier review requirements for dimethyl mercury.

7.6 Second Tier Review – Dimethyl Mercury

It is proposed that RPP-ENV-59016, which was previously reviewed and approved by Ecology on January 21, 2016, (letter Hanlon-Meyer 2016) be used to satisfy WAC 173-460-090 requirements for dimethyl mercury for this NOC application. RPP-ENV-59016 is a bounding dimethyl mercury health impact assessment that includes the emissions from the activities proposed in this NOC application. The total estimated dimethyl mercury emissions, 1.67E-10 g/s, is 0.0000016% of the total dimethyl mercury modeled in RPP-ENV-59016 of 1.02E-02 g/s.

8.0 VENTILATION PROCESS AND EMISSIONS CONTROL SYSTEMS

8.1 Ventilation System Description

The 222-SL Laboratory ventilation system is designed to provide adequate ventilation for analytical and laboratory processes, as well as the characteristics necessary to meet high performance sustainable building certification requirements.

A single air handling unit will provide conditioned outside air to laboratory spaces. The exhaust system will draw air through multiple fume hoods, snorkel vents, and ductwork in the mezzanine level of the building, and exhaust it to the atmosphere via a commercially available exhauster consisting of an inline fan and stack package unit located on the roof. Figure 3 shows a general exhauster layout.

The exhaust system is designed to allow for variable flow at user locations (e.g., fume hoods) as well as a stack with a variable discharge nozzle geometry to optimize building energy efficiency. Air flow at the stack nozzle will vary from a nominal 5,384 cfm to 10,370 cfm and will be automatically controlled (RPP-CALC-61045). Air flow at any given time will vary depending on laboratory usage and environmental conditions. Figures 5 and 6 show the general air flow diagram H-2-836987, "Mechanical/HVAC Cold Lab Air Flow Diagram, October 2016."

No emissions abatement equipment will be installed per the tBACT evaluation in Section 9.0. A sample port will be available for obtaining exhaust samples in a common duct plenum immediately upstream from the fan and stack package unit. Figure 4 shows the stack and sample port layout.

8.2 Laboratory Processes and Source of Emissions

The 222-SL Laboratory will be used to perform non-radiological analyses and other processes. The building will have several major work areas that may perform the following types of work.

8.2.1 Process Chemistry

Process chemistry includes custom designed experiments to support ongoing Hanford Site programs, including programs managed by the Tank Operations Contractor and Waste Treatment Plant organizations. The activities performed generally will involve preparation of non-radiological simulants of DST or SST tank waste material which are composed of a mixture of inorganic salts, bases, and acids, as well as organic complexing agents. Also, testing of various equipment used to perform spectroscopy, measure electrochemical properties, measure viscometry and other physical characteristics of tank waste simulants or Hanford Tank Waste Treatment and Immobilization Plant glass simulants may occur. These activities are not expected to emit TAPs except those that could be associated with the potential reagents or standards used in an experiment which are included in the emissions calculation for standards and reagents. Calculated estimated emissions for standards and reagents use are sufficiently conservative to account for these activities.

8.2.2 Organics Analyses

The 222-SL Laboratory will provide for organics analyses of vapor samples by gas chromatography/mass spectrometry (GC/MS) and space to develop other organics analyses methods. Samples will predominantly consist of tank headspace or other types of area samples. Potential emissions of TAPs from these activities are assumed to occur via the exhaust of the GC/MS units when vapor samples or analytical standards containing TAPs are processed. An estimate of these potential emissions is incorporated into Appendix A.

8.2.3 Industrial Health Analyses

The 222-SL Laboratory will receive and process work area vapor tube samples to support Tank Farms. Samples will be analyzed for constituents such as mercury and ammonia. Estimated emissions of TAPs from these activities are bounded by the Table A-1 Lab Analytical and Reagents column.

8.2.4 Standards Laboratory

Chemical shipments will be received into the 222-SL Laboratory and stored in a chemical storage area or used to develop standards or reagents for use in the 222-S or 222-SL Laboratories. Estimated emissions of TAPs from these activities are incorporated into the Table A-1 Lab Analytical and Reagents column.

Figure 3. General Exhauster Layout of 222-SL Laboratory.

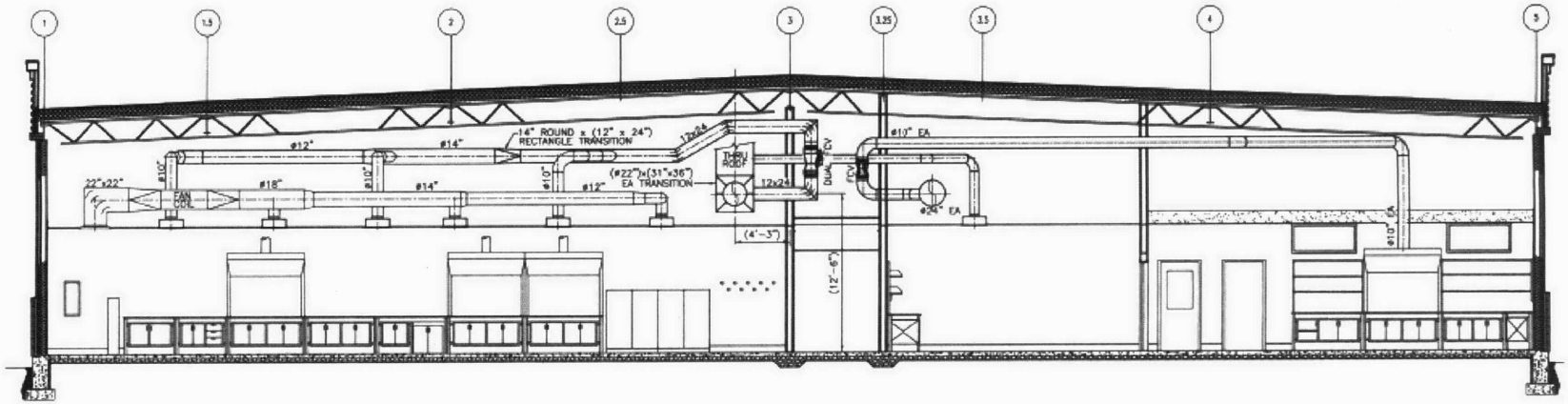
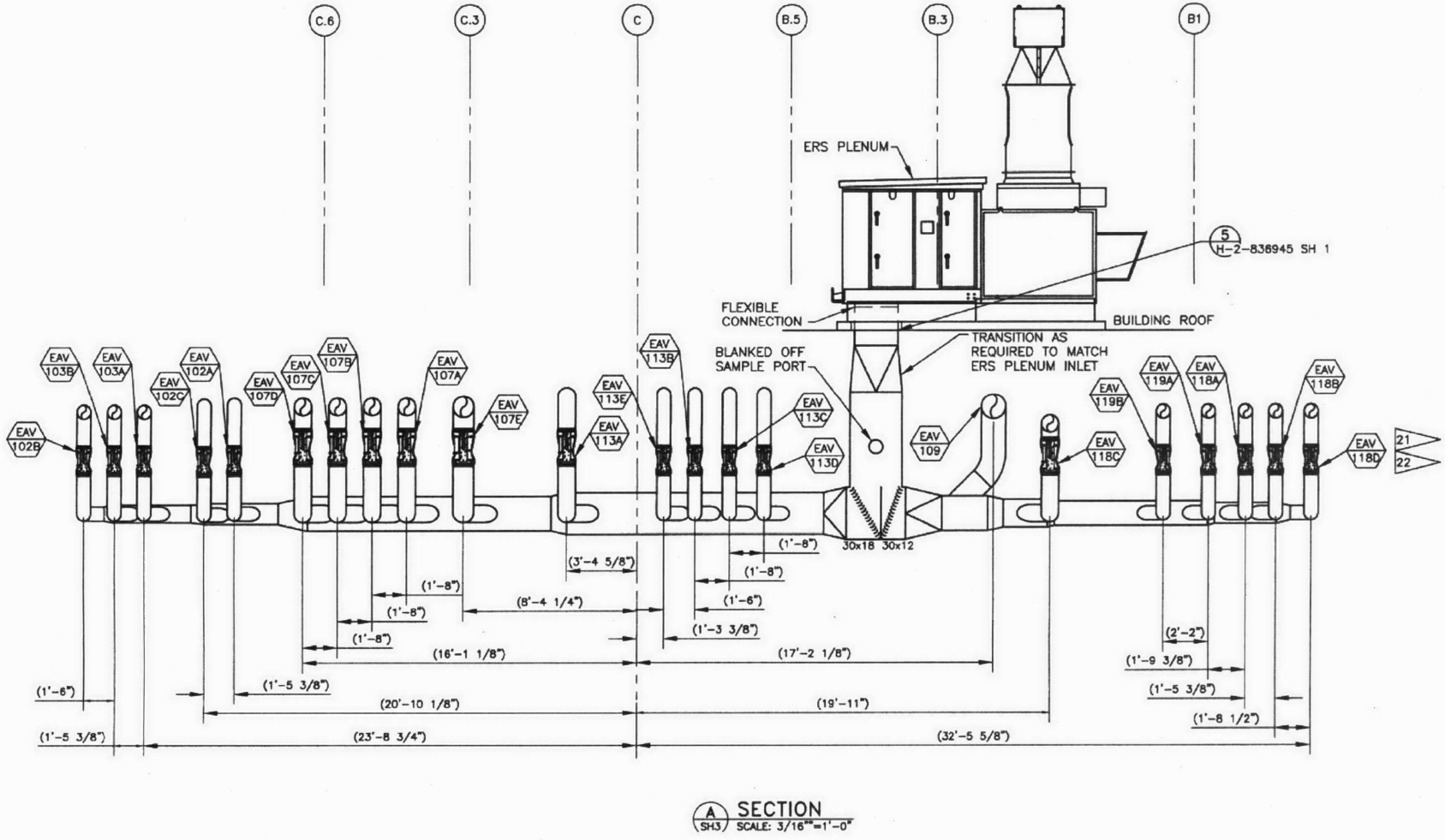


Figure 4. Stack and Sample Port Layout of 222-SL Laboratory.



A SECTION
SH3 SCALE: 3/16"=1'-0"

Figure 5. General Air Flow Diagram of 222-SL Laboratory (Sheet 1).

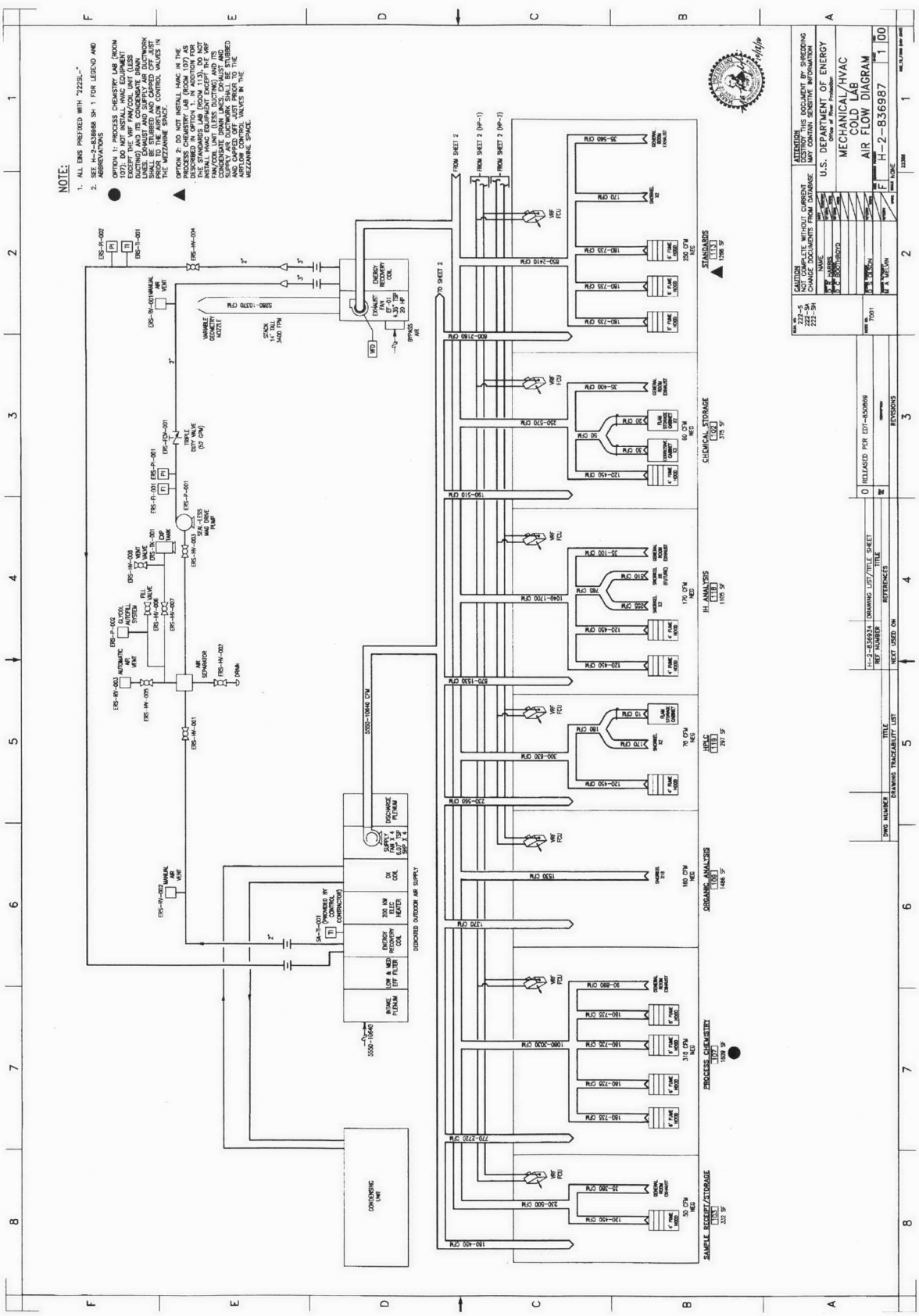
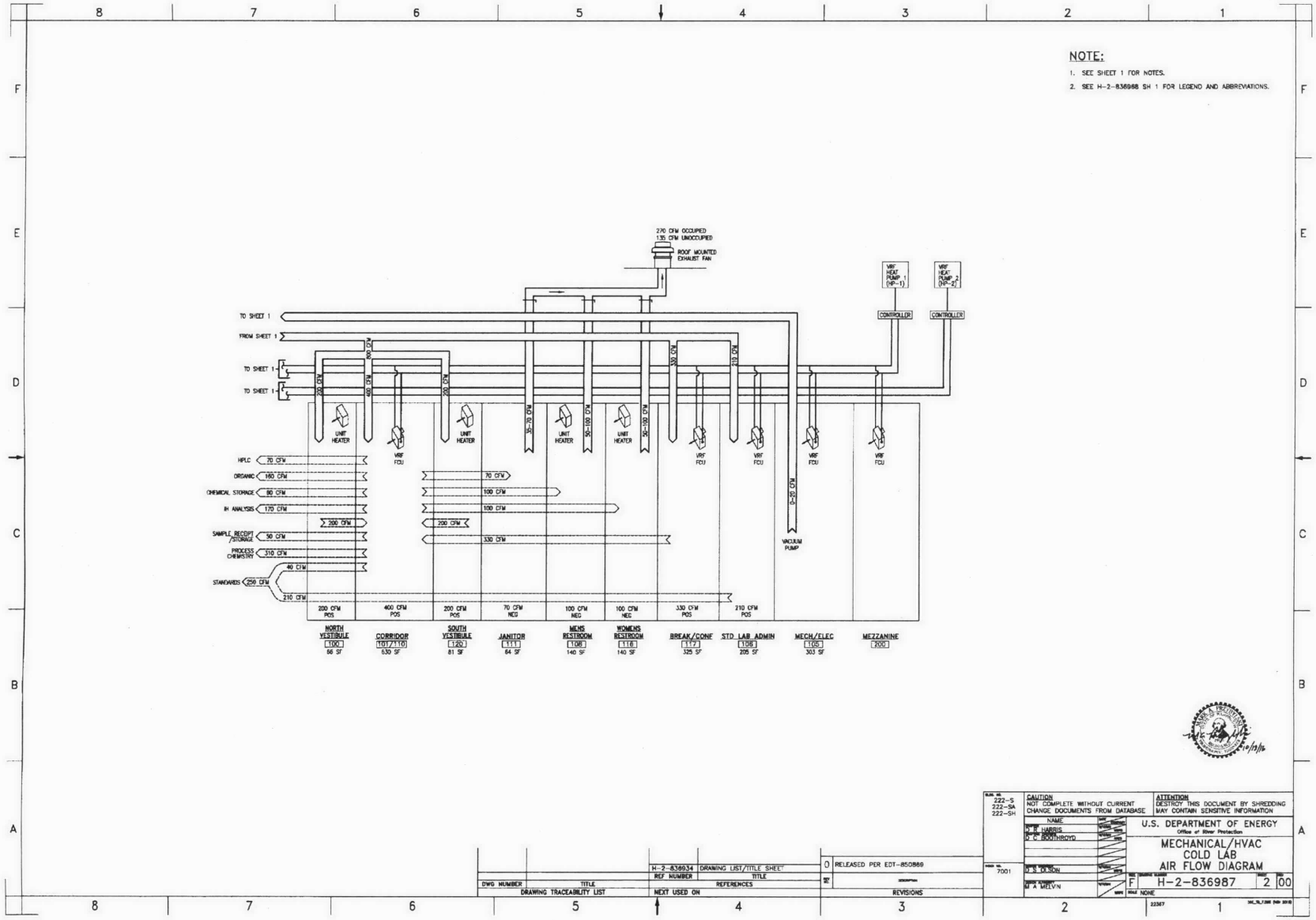


Figure 5. General Air Flow Diagram of 222-SL Laboratory (Sheet 2)



9.0 BEST AVAILABLE CONTROL TECHNOLOGY

Pursuant to WAC 173-400-113(2), an analysis of best available control technology (BACT) for emissions of criteria pollutants was performed, as well as a tBACT analysis pursuant to WAC 173-460-060(2) for toxics. RPP-20773, "Evaluation of Best Available Control Technology for Toxics (tBACT), Waste Retrieval System Operations in Single Shell Tank Farms," documents tBACT for use during retrieval of waste from SSTs. RPP-ENV-46679, Rev. 01, "Evaluation of Best Available Control Technology for Toxics (tBACT) Double Shell Tank Farms Primary Ventilation Systems Supporting Waste Transfer Operations," documents the tBACT analysis for DSTs. Since the same constituents are being brought into the 222-SL Laboratory as was analyzed in the SST and DST tBACTs, RPP-ENV-46679, Rev. 01, and RPP-20773 are proposed to be used to satisfy the tBACT requirement for the 222-SL Laboratory.

The tBACT analysis was performed using the top-down approach established for BACT. This approach is defined in detail in "New Source Review Workshop Manual: Prevention of Significant Deterioration and Nonattainment Area Permitting" (EPA 1990). The approach consists of the following steps:

1. Identify all control technologies.
2. Eliminate technically infeasible options.
3. Rank remaining control technologies by control effectiveness.
4. Evaluate most effective controls and document results.
5. Select BACT.

Some of the technology options were eliminated from further consideration because of technical infeasibility. A detailed evaluation of the emissions control technologies was performed. After an effectiveness analysis, a cost per ton of pollutant removed was calculated. Most of the costs per ton exceeded the cost ceiling estimates guidelines previously approved by Ecology and the U.S. Environmental Protection Agency as economically justifiable. Due to the low emissions rates, the cost per ton to remove the pollutants becomes prohibitively expensive. Even though the options evaluated would remove a high portion of the emissions, typically 98-99%, the cost of the equipment would be prohibitively high according to the available Ecology guidelines.

The tBACT analyses for SSTs and DSTs concluded that operation of a standard exhauster configuration (including moisture de-entrainer, pre-heater, and high efficiency particulate air filtration system) is the selected tBACT control technology. However, the 222-SL Laboratory is a nonradiological laboratory and all samples to be analyzed in the facility will be collected through a high efficiency particulate filter. Therefore, no control technology is proposed for the 222-SL Laboratory.

10.0 EMISSIONS LIMITS AND MONITORING

10.1 Emissions Limits

Appendix A, Table A-2 provides the proposed permit emissions limits for the two TAPs that exceeded de minimis values, dimethyl mercury and n-nitrosodimethylamine.

10.2 Monitoring

The total estimated emissions for dimethyl mercury and n-nitrosodimethylamine are very low. The total estimated dimethyl mercury emissions rate for 222-SL Laboratory is 1.67E-10 g/s, which is 0.0000016% of the total dimethyl mercury modeled in RPP-ENV-59016. The total estimated n-nitrosodimethylamine emissions of 0.0195 lbs/averaging period does not exceed the small quantity emissions rate of 0.0416 lbs/averaging period. Therefore, no monitoring is proposed for 222-SL Laboratory.

11.0 REFERENCES

DOE/EIS-0391, 2012, "Tank Closure and Waste Management Environmental Impact Statement for the Hanford Site, Richland, Washington," Volume 2, Book 2, Appendix E.1.1.1.2., Operations and Maintenance, U.S. Department of Energy, Office of River Protection, Richland, Washington.

Ecology, 2015, "Guidance Document: First, Second, and Third Tier Review of Toxic Air Pollution Sources," 08-02-025, Washington State Department of Ecology, Lacey, Washington.

EPA-454/B-03-001, 2004, "User's Guide for the AMS/EPS Regulatory Model – AERMOD," U.S. Environmental Protection Agency, Research Triangle Park, North Carolina.

EPA, 1990, "New Source Review Workshop Manual – Prevention of Significant Deterioration and Nonattainment Area Permitting," U.S. Environmental Protection Agency, Washington, D.C.

H-2-836987, 2016, "Mechanical/HVAC Cold Lab Air Flow Diagram, October 2016" Washington River Protection Solutions LLC, Richland, Washington.

Hanlon-Meyer, C., 2016, "Re: Second Tier Petition by the U.S. Department of Energy," January 21, letter to R. Skinnarland, Washington State Department of Ecology, Olympia, Washington.

RCW 43.21C, "State Environmental Policy Act," *Revised Code of Washington*, as amended.

RPP-20773, 2004, "Evaluation of Best Available Control Technology for Toxics (tBACT), Waste Retrieval System Operations in Single Shell Tank Farms," Washington River Protection Solutions LLC, Richland, Washington.

RPP-CALC-61045, 2016, "222-SL Cold Lab HVAC Exhaust Fan Sizing," Washington River Protection Solutions LLC, Richland, Washington.

RPP-CALC-61288, 2016, "222-SL Laboratory Emissions Calculations Supporting TOC-ENV-NOC-5269, Rev 00," Washington River Protection Solutions LLC, Richland, Washington.

RPP-ENV-46679 Rev. 01, 2010, "Evaluation of Best Available Control Technology for Toxics (tBACT) Double Shell Tank Farms Primary Ventilation Systems Supporting Waste Transfer Operations," Washington River Protection Solutions LLC, Richland, Washington.

RPP-ENV-59016, 2015, "Second Tier Review Petition for Hanford Tank Farm and Waste Treatment Plant Dimethyl Mercury Emissions," Rev. 01, Washington River Protection Solutions LLC, Richland, Washington.

SWIHD, Site Wide Industrial Hygiene Database, Queried December 2016.

TWINS, 2016, Tank Waste Information Network System database, Queried December 2016, [Best Basis Inventory – Best Basis Summary], http://twins.labworks.org/twinsdata/Forms/About.aspx

WAC 173-400, "General Regulations for Air Pollution Sources," *Washington Administrative Code*, as amended.

WAC 173-460, "Controls for New Sources of Toxic Air Pollutants," *Washington Administrative Code*, as amended.

WAC 197-11, "SEPA Rules," *Washington Administration Code*, as amended.

Appendix A

Criteria and Toxic Air Pollutant Emission Rates

Table A-1. Criteria Pollutants Emission Rates and Comparison to De Minimis Levels.

Analyte	CAS	Averaging Period	Emission Rate (lbs/year)	De Minimis (lbs/year)	Above De Minimis?
Nitrogen dioxide	10102-44-0	Year	1.53E-02	4,000	No
VOCs	Various	Year	3.47E+00	4,000	No
Sulfur dioxide	7446-09-5	Year	8.68E-03	4,000	No
Lead and compounds (NOS)	10099-74-8	Year	6.61E-02	10	No
Carbon monoxide	630-08-0	Year	6.67E-01	10,000	No

Table A-2. Toxic Air Pollutant Estimated Emission Rates and Comparison to the WAC 173-460-150 de minimis, SQER, and ASIL Levels

CAS	Analyte	TAPs from Samples (g/s)	Standards and Chem Usage Final (g/s)	Combined Emissions (g/s)	Dispersed Concentration (ug/m3)	Averaging Period	Emissions (lbs/averaging period)	ASIL	Exceeds ASIL?	SQER	Exceeds SQER?	De Minimis	Exceeds De Minimis?
100-41-4	ethylbenzene	5.16E-08	2.40E-09	5.40E-08	6.46E-09	year	3.75E-03	0.4	No	76.8	No	3.84	No
100-42-5	Styrene	9.96E-08	2.42E-09	1.02E-07	2.69E-07	24-hr	1.94E-05	900	No	118	No	5.91	No
10061-01-5	cis-1,3-dichloro-1-propene	5.32E-09	2.51E-09	7.83E-09	9.37E-10	year	5.44E-04	0.0625	No	12	No	0.6	No
10061-02-6	trans-1,3-dichloro-1-propene	4.94E-09	2.51E-09	7.45E-09	8.92E-10	year	5.18E-04	0.0625	No	12	No	0.6	No
100-75-4	n-Nitrosopiperidine	5.86E-12	0.00E+00	5.86E-12	7.02E-13	year	4.07E-07	0.00037	No	0.071	No	0.00355	No
10102-44-0	Nitrogen oxide (NO2)	2.20E-07	0.00E+00	2.20E-07	1.24E-05	1-hr	1.75E-06	470	No	1.03	No	0.457	No
101-68-8	Methylene diphenyl isocyanate	0.00E+00	5.70E-09	5.70E-09	1.50E-08	24-hr	1.09E-06	0.7	No	0.092	No	0.0046	No
10595-95-6	n-Nitrosomethylethylamine	1.85E-08	0.00E+00	1.85E-08	2.22E-09	year	1.29E-03	0.000159	No	0.0305	No	0.00153	No
106-42-3	p-Xylene	8.06E-08	5.45E-11	8.07E-08	2.13E-07	24-hr	1.54E-05	221	No	29	No	1.45	No
106-46-7	1,4-Dichlorobenzene	8.04E-09	3.50E-09	1.15E-08	1.38E-09	year	8.03E-04	0.0909	No	17.4	No	0.872	No
106-88-7	Oxirane, ethyl-	2.08E-08	0.00E+00	2.08E-08	5.47E-08	24-hr	3.96E-06	20	No	2.63	No	0.131	No
106-93-4	1,2-Dibromoethane	1.29E-08	1.38E-10	1.30E-08	1.56E-09	year	9.06E-04	0.0141	No	2.71	No	0.135	No
106-99-0	1,3-butadiene	6.26E-07	1.22E-08	6.38E-07	7.65E-08	year	4.44E-02	0.00588	No	1.13	No	0.0564	No
107-02-8	acrolein	1.53E-09	1.27E-09	2.80E-09	7.38E-09	24-hr	5.34E-07	0.06	No	0.00789	No	0.000394	No
107-05-1	3-chloropropene (Allyl Chloride)	1.69E-09	1.73E-09	3.42E-09	4.10E-10	year	2.38E-04	0.167	No	32	No	1.6	No
107-06-2	1,2-Dichloroethane	4.74E-09	2.32E-09	7.06E-09	8.45E-10	year	4.91E-04	0.0385	No	7.39	No	0.369	No
107-13-1	acrylonitrile	1.99E-09	1.20E-09	3.19E-09	3.82E-10	year	2.22E-04	0.00345	No	0.662	No	0.0331	No
107-21-1	Ethylene Glycol	0.00E+00	1.76E-08	1.76E-08	4.63E-08	24-hr	3.35E-06	400	No	52.6	No	2.63	No
108-05-4	Acetic acid ethenyl ester	2.30E-10	0.00E+00	2.30E-10	6.07E-10	24-hr	4.39E-08	200	No	26.3	No	1.31	No
108-10-1	Methyl isobutyl ketone	4.41E-07	2.27E-09	4.43E-07	1.17E-06	24-hr	8.45E-05	3000	No	394	No	19.7	No
108-38-3	m-Xylene	1.40E-07	5.45E-11	1.40E-07	3.68E-07	24-hr	2.66E-05	221	No	29	No	1.45	No
108-39-4	Phenol, 3-methyl-	7.67E-10	0.00E+00	7.67E-10	2.02E-09	24-hr	1.46E-07	600	No	78.9	No	3.94	No
108-88-3	toluene	6.30E-07	5.73E-08	6.88E-07	1.81E-06	24-hr	1.31E-04	5000	No	657	No	32.9	No
108-90-7	chlorobenzene	9.63E-09	2.55E-09	1.22E-08	3.21E-08	24-hr	2.32E-06	1000	No	131	No	6.57	No
108-95-2	Phenol	1.26E-07	8.63E-09	1.34E-07	3.54E-07	24-hr	2.56E-05	200	No	26.3	No	1.31	No
110-54-3	n-hexane	6.82E-07	4.13E-05	4.20E-05	1.11E-04	24-hr	7.99E-03	700	No	92	No	4.6	No
110-82-7	cyclohexane	3.26E-07	2.67E-08	3.53E-07	9.30E-07	24-hr	6.73E-05	6000	No	789	No	39.4	No
111-44-4	Bis(chloroethyl)ether	0.00E+00	1.74E-10	1.74E-10	2.08E-11	year	1.21E-05	0.00141	No	0.271	No	0.0135	No
111-76-2	Ethanol, 2-butoxy-	2.45E-08	0.00E+00	2.45E-08	6.46E-08	24-hr	4.67E-06	13000	No	1710	No	85.4	No
115-07-1	1-Propene	6.35E-07	0.00E+00	6.35E-07	1.67E-06	24-hr	1.21E-04	3000	No	394	No	19.7	No
117-81-7	Di(2-ethylhexyl)phthalate	4.69E-09	1.41E-10	4.83E-09	5.78E-10	year	3.36E-04	0.0417	No	8	No	0.4	No
118-74-1	Hexachlorobenzene	0.00E+00	2.91E-10	2.91E-10	3.48E-11	year	2.02E-05	0.00196	No	0.376	No	0.0188	No
121-14-2	2,4-Dinitrotoluene	0.00E+00	2.17E-10	2.17E-10	2.60E-11	year	1.51E-05	0.0112	No	2.15	No	0.107	No
121-44-8	Triethylamine	0.00E+00	2.38E-07	2.38E-07	6.26E-07	24-hr	4.53E-05	200	No	26.3	No	1.31	No
123-91-1	1,4-dioxane	2.44E-08	1.99E-09	2.64E-08	3.17E-09	year	1.84E-03	0.13	No	24.9	No	1.25	No
124-48-1	Dibromochloromethane	0.00E+00	1.55E-10	1.55E-10	1.86E-11	year	1.08E-05	0.037	No	7.1	No	0.355	No

Table A-2. Toxic Air Pollutant Estimated Emission Rates and Comparison to the WAC 173-460-150 de minimis, SQER, and ASIL Levels

CAS	Analyte	TAPs from Samples (g/s)	Standards and Chem Usage Final (g/s)	Combined Emissions (g/s)	Dispersed Concentration (ug/m3)	Averaging Period	Emissions (lbs/averaging period)	ASIL	Exceeds ASIL?	SQER	Exceeds SQER?	De Minimis	Exceeds De Minimis?
127-18-4	tetrachloroethene	1.14E-06	3.86E-09	1.14E-06	1.37E-07	year	7.94E-02	0.169	No	32.4	No	1.62	No
1310-73-2	Sodium Hydroxide	0.00E+00	9.90E-05	9.90E-05	5.56E-03	1-hr	7.86E-04	8	No	0.0175	No	0.000876	No
1330-20-7	Benzene, dimethyl-	1.74E-07	0.00E+00	1.74E-07	4.59E-07	24-hr	3.32E-05	221	No	29	No	1.45	No
1336-36-3	PCBs	3.26E-09	0.00E+00	3.26E-09	3.91E-10	year	2.27E-04	0.00175	No	0.336	No	0.0168	No
139-13-9	Nitrilotriacetic acid	0.00E+00	6.34E-07	6.34E-07	7.59E-08	year	4.41E-02	0.667	No	128	No	6.4	No
156-60-5	Trans-1,2-dichloroethene	0.00E+00	7.97E-11	7.97E-11	2.10E-10	24-hr	1.52E-08	807	No	106	No	5.3	No
1634-04-4	Methyl Tertiary Butyl Ether	0.00E+00	7.79E-09	7.79E-09	9.32E-10	year	5.41E-04	3.85	No	739	No	36.9	No
193-39-5	Indeno[1,2,3-cd]pyrene	0.00E+00	1.95E-10	1.95E-10	2.34E-11	year	1.36E-05	0.00909	No	1.74	No	0.0872	No
205-99-2	Benzo[b]fluoranthene	0.00E+00	1.84E-10	1.84E-10	2.20E-11	year	1.28E-05	0.00909	No	1.74	No	0.0872	No
207-08-9	Benzo[k]fluoranthene	0.00E+00	1.84E-10	1.84E-10	2.20E-11	year	1.28E-05	0.00909	No	1.74	No	0.0872	No
218-01-9	Chrysene	0.00E+00	1.70E-10	1.70E-10	2.03E-11	year	1.18E-05	0.0909	No	17.4	No	0.872	No
25013-16-5	Phenol, (1,1-dimethylethyl)-4-methoxy-	2.30E-10	0.00E+00	2.30E-10	2.76E-11	year	1.60E-05	17.5	No	3360	No	168	No
39635-31-9	2,3,3',4,4',5,5'-Heptachlorobiphenyl	0.00E+00	2.06E-13	2.06E-13	2.47E-14	year	1.43E-08	0.000263	No	0.0505	No	0.00252	No
50-00-0	Formaldehyde	2.80E-08	1.36E-08	4.17E-08	4.99E-09	year	2.90E-03	0.167	No	32	No	1.6	No
50-29-3	DDT	0.00E+00	1.79E-09	1.79E-09	2.15E-10	year	1.25E-04	0.0103	No	1.98	No	0.0988	No
53-70-3	Dibenz[a,h]anthracene	0.00E+00	3.31E-10	3.31E-10	3.97E-11	year	2.30E-05	0.000833	No	0.16	No	0.00799	No
542-75-6	1,3-Dichloropropene	4.94E-09	0.00E+00	4.94E-09	5.91E-10	year	3.43E-04	0.0625	No	12	No	0.6	No
55-18-5	n-Nitrosodiethylamine	1.15E-10	0.00E+00	1.15E-10	1.37E-11	year	7.97E-06	0.0001	No	0.0192	No	0.000959	No
56-23-5	carbon tetrachloride	1.71E-07	3.48E-09	1.74E-07	2.09E-08	year	1.21E-02	0.0238	No	4.57	No	0.228	No
56-55-3	Benz[a]anthracene	0.00E+00	1.70E-10	1.70E-10	2.03E-11	year	1.18E-05	0.00909	No	1.74	No	0.0872	No
57-14-7	Hydrazine, 1,1-dimethyl-	8.96E-10	0.00E+00	8.96E-10	2.36E-09	24-hr	1.71E-07	0.5	No	0.0657	No	0.00329	No
57-55-6	1,2-Propanediol	3.88E-08	0.00E+00	3.88E-08	1.02E-07	24-hr	7.38E-06	28.5	No	3.75	No	0.187	No
57-74-9	Chlordane	0.00E+00	1.11E-09	1.11E-09	1.33E-10	year	7.71E-05	0.00294	No	0.564	No	0.0282	No
593-74-8	Dimethyl Mercury	1.67E-10	0.00E+00	1.67E-10	4.41E-10	24-hr	3.19E-08	1E-99	Yes	1E-99	Yes	1E-99	Yes
59-89-2	n-Nitrosomorpholine	4.60E-09	0.00E+00	4.60E-09	5.51E-10	year	3.20E-04	0.000526	No	0.101	No	0.00505	No
60-35-5	Acetamide	9.79E-10	0.00E+00	9.79E-10	1.17E-10	year	6.81E-05	0.05	No	9.59	No	0.48	No
621-64-7	n-Nitrosodi-n-propylamine	3.74E-11	1.30E-10	1.67E-10	2.00E-11	year	1.16E-05	0.0005	No	0.0959	No	0.0048	No
624-83-9	Methane, isocyanato-	3.52E-09	0.00E+00	3.52E-09	9.29E-09	24-hr	6.71E-07	1	No	0.131	No	0.00657	No
62-53-3	Aniline	0.00E+00	1.45E-10	1.45E-10	1.74E-11	year	1.01E-05	0.625	No	120	No	6	No
62-75-9	n-Nitrosodimethylamine	2.81E-07	1.43E-10	2.81E-07	3.37E-08	year	1.95E-02	0.000217	No	0.0416	No	0.00208	Yes
630-08-0	Carbon monoxide	9.59E-06	0.00E+00	9.59E-06	5.38E-04	1-hr	7.61E-05	23000	No	50.4	No	1.14	No
67-56-1	methanol	4.28E-06	2.94E-07	4.57E-06	1.20E-05	24-hr	8.71E-04	4000	No	526	No	26.3	No
67-63-0	2-Propanol	5.46E-07	0.00E+00	5.46E-07	3.07E-05	1-hr	4.33E-06	3200	No	7.01	No	0.35	No
67-66-3	chloroform	5.31E-07	2.70E-09	5.33E-07	6.39E-08	year	3.71E-02	0.0435	No	8.35	No	0.417	No

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CAS	Analyte	TAPs from Samples (g/s)	Standards and Chem Usage Final (g/s)	Combined Emissions (g/s)	Dispersed Concentration (ug/m3)	Averaging Period	Emissions (lbs/averaging period)	ASIL	Exceeds ASIL?	SQER	Exceeds SQER?	De Minimis	Exceeds De Minimis?
67-72-1	Hexachloroethane	0.00E+00	2.98E-10	2.98E-10	3.57E-11	year	2.07E-05	0.0909	No	17.4	No	0.872	No
71-43-2	benzene	3.37E-07	1.77E-09	3.39E-07	4.06E-08	year	2.36E-02	0.0345	No	6.62	No	0.331	No
71-55-6	1,1,1-Trichloroethane	8.62E-09	8.37E-11	8.71E-09	2.29E-08	24-hr	1.66E-06	1000	No	131	No	6.57	No
7439-97-6	Mercury, Elemental	3.82E-08	7.92E-16	3.82E-08	1.01E-07	24-hr	7.27E-06	0.09	No	0.0118	No	0.000591	No
7440-43-9	Cadmium	3.65E-10	0.00E+00	3.65E-10	4.37E-11	year	2.54E-05	0.000238	No	0.0457	No	0.00228	No
7446-09-05	Sulfur Dioxide	1.25E-07	0.00E+00	1.25E-07	7.01E-06	1-hr	9.91E-07	660	No	1.45	No	0.457	No
74-83-9	Methyl Bromide	6.50E-09	2.74E-11	6.52E-09	1.72E-08	24-hr	1.24E-06	5	No	0.657	No	0.0629	No
74-87-3	Methyl Chloride	1.72E-08	3.52E-11	1.73E-08	4.55E-08	24-hr	3.29E-06	90	No	11.8	No	0.591	No
75-00-3	chloroethane	1.11E-08	1.47E-09	1.25E-08	3.30E-08	24-hr	2.39E-06	30000	No	3940	No	197	No
75-01-4	Vinyl Chloride	4.70E-09	1.45E-10	4.85E-09	5.81E-10	year	3.37E-04	0.0128	No	2.46	No	0.123	No
75-05-8	acetonitirle	2.68E-06	9.29E-10	2.68E-06	3.21E-07	year	1.87E-01	60	No	11500	No	576	No
75-07-0	acetaldehyde	1.81E-06	9.97E-10	1.81E-06	2.17E-07	year	1.26E-01	0.37	No	71	No	3.55	No
75-09-2	methylene chloride	1.80E-06	3.48E-07	2.15E-06	2.57E-07	year	1.49E-01	1	No	192	No	9.59	No
75-15-0	Carbon disulfide	6.19E-07	7.99E-11	6.20E-07	1.63E-06	24-hr	1.18E-04	800	No	105	No	5.26	No
75-21-8	Oxirane	3.98E-09	0.00E+00	3.98E-09	4.76E-10	year	2.77E-04	0.0114	No	2.19	No	0.109	No
75-25-2	Bromoform	0.00E+00	1.83E-10	1.83E-10	2.19E-11	year	1.27E-05	0.909	No	174	No	8.72	No
75-27-4	Bromodichloromethane	0.00E+00	1.25E-10	1.25E-10	1.50E-11	year	8.73E-06	0.027	No	5.18	No	0.259	No
75-34-3	1,1-dichloroethane	4.40E-09	2.31E-09	6.72E-09	8.04E-10	year	4.67E-04	0.625	No	120	No	6	No
75-35-4	1,1-Dichloroethylene	1.61E-06	2.27E-09	1.61E-06	4.24E-06	24-hr	3.07E-04	200	No	26.3	No	1.31	No
75-45-6	Methane, chlorodifluoro-	5.13E-07	0.00E+00	5.13E-07	1.35E-06	24-hr	9.78E-05	50000	No	6570	No	328	No
75-68-3	Ethane, 1-chloro-1,1-difluoro-	5.57E-07	0.00E+00	5.57E-07	1.47E-06	24-hr	1.06E-04	50000	No	6570	No	329	No
7647-01-0	Hydrogen chloride	0.00E+00	1.37E-04	1.37E-04	3.61E-04	24-hr	2.61E-02	9	No	1.18	No	0.0591	No
7664-38-2	Phosphoric Acid	0.00E+00	3.96E-06	3.96E-06	1.04E-05	24-hr	7.55E-04	7	No	0.92	No	0.046	No
7664-39-3	Hydrogen Fluoride	0.00E+00	1.38E-06	1.38E-06	3.63E-06	24-hr	2.62E-04	14	No	1.84	No	0.092	No
7664-41-7	Ammonia	1.46E-04	0.00E+00	1.46E-04	3.84E-04	24-hr	2.78E-02	70.8	No	9.31	No	0.465	No
7664-93-9	Sulfuric Acid	0.00E+00	1.08E-07	1.08E-07	2.84E-07	24-hr	2.05E-05	1	No	0.131	No	0.00657	No
7697-37-2	Nitric Acid	0.00E+00	1.13E-04	1.13E-04	6.37E-03	1-hr	9.00E-04	86	No	0.188	No	0.00942	No
7723-14-0	Phosphorus	4.27E-09	0.00E+00	4.27E-09	1.12E-08	24-hr	8.13E-07	20	No	2.63	No	0.131	No
77-47-4	Hexachlorocyclopentadiene	0.00E+00	2.42E-10	2.42E-10	6.39E-10	24-hr	4.62E-08	0.2	No	0.026	No	0.00131	No
7783-20-2	Ammonium sulfate	0.00E+00	6.46E-09	6.46E-09	3.63E-07	1-hr	5.13E-08	120	No	0.263	No	0.0131	No
78-59-1	Isophorone	0.00E+00	1.31E-10	1.31E-10	3.46E-10	24-hr	2.50E-08	2000	No	2.63	No	13.1	No
78-87-5	1,2-Dichloropropane	7.74E-09	7.35E-11	7.81E-09	9.35E-10	year	5.43E-04	0.1	No	19.2	No	0.959	No
78-93-3	2-butanone	4.93E-06	2.07E-07	5.14E-06	1.35E-05	24-hr	9.79E-04	5000	No	657	No	32.9	No
79-00-5	1,1,2-trichloroethane	3.79E-08	3.31E-09	4.12E-08	4.94E-09	year	2.87E-03	0.0625	No	12	No	0.6	No
79-01-6	trichloroethylene	4.10E-07	3.07E-09	4.13E-07	4.95E-08	year	2.87E-02	0.5	No	95.9	No	4.8	No
79-10-7	Acrylic Acid	3.35E-07	8.32E-08	4.18E-07	1.10E-06	24-hr	7.96E-05	1	No	0.131	No	0.00657	No

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CAS	Analyte	TAPs from Samples (g/s)	Standards and Chem Usage Final (g/s)	Combined Emissions (g/s)	Dispersed Concentration (ug/m3)	Averaging Period	Emissions (lbs/averaging period)	ASIL	Exceeds ASIL?	SQER	Exceeds SQER?	De Minimis	Exceeds De Minimis?
79-34-5	1,1,2,2-tetrachloroethane	3.16E-08	3.90E-09	3.55E-08	4.25E-09	year	2.47E-03	0.0172	No	3.3	No	0.165	No
79-46-9	nitropropane; 2-Nitropropane	3.35E-08	0.00E+00	3.35E-08	8.84E-08	24-hr	6.39E-06	20	No	2.63	No	0.131	No
811-97-2	1,1,1,2-Tetrafluoroethane	0.00E+00	5.70E-05	5.70E-05	1.50E-04	24-hr	1.09E-02	80000	No	10500	No	526	No
87-68-3	Hexachlorobutadiene	1.52E-08	2.37E-10	1.54E-08	1.84E-09	year	1.07E-03	0.0455	No	8.73	No	0.437	No
87-86-5	Pentachlorophenol	0.00E+00	2.82E-10	2.82E-10	3.38E-11	year	1.96E-05	0.217	No	41.6	No	2.08	No
88-06-2	2,4,6-Trichlorophenol	0.00E+00	2.40E-10	2.40E-10	2.87E-11	year	1.67E-05	0.05	No	9.59	No	0.48	No
91-20-3	Naphthalene	6.68E-09	1.63E-12	6.68E-09	8.00E-10	year	4.65E-04	0.0294	No	5.64	No	0.282	No
924-16-3	n-Nitroso-di-n-butylamine	6.67E-10	0.00E+00	6.67E-10	7.98E-11	year	4.63E-05	0.000323	No	0.062	No	0.0031	No
92-87-5	Benzidine	0.00E+00	2.18E-10	2.18E-10	2.61E-11	year	1.51E-05	0.00000714	No	0.00137	No	0.0000685	No
930-55-2	n-Nitrosopyrrolidine	1.47E-11	0.00E+00	1.47E-11	1.76E-12	year	1.02E-06	0.00167	No	0.32	No	0.016	No
95-47-6	o-Xylene	1.18E-07	5.58E-11	1.18E-07	3.11E-07	24-hr	2.25E-05	221	No	29	No	1.45	No
95-48-7	2-Methylphenol	4.60E-09	1.50E-10	4.75E-09	1.25E-08	24-hr	9.06E-07	600	No	78.9	No	3.94	No
96-12-8	1,2-Dibromo-3-chloropropane	0.00E+00	1.33E-10	1.33E-10	1.59E-11	year	9.25E-06	0.000526	No	0.101	No	0.00505	No
98-82-8	Cumene	3.62E-08	1.37E-08	4.98E-08	1.31E-07	24-hr	9.50E-06	400	No	52.6	No	2.63	No
	Copper & Compounds	0.00E+00	8.71E-13	8.71E-13	4.89E-11	1-hr	6.92E-12	100	No	0.219	No	0.011	No
	Fluoride containing chemicals, NOS	0.00E+00	2.26E-11	2.26E-11	5.94E-11	24-hr	4.30E-09	13	No	1.71	No	0.0854	No
	Lead and compounds (NOS)	0.00E+00	9.51E-07	9.51E-07	1.14E-07	year	6.61E-02	0.0833	No	16	No	10	No
	Selenium & Selenium Compounds (other than Hydrogen Selenide)	0.00E+00	3.80E-07	3.80E-07	1.00E-06	24-hr	7.24E-05	20	No	2.63	No	0.131	No

Attachment 2
17-ECD-0019
(7 Pages Excluding Cover Sheet)

Notice of Construction Application
TOC-ENV-NOC-5269, Rev. 0

DEPARTMENT OF ECOLOGY
State of Washington

Notice of Construction Application

This application applies statewide for facilities under the Department of Ecology's jurisdiction. Submit this form for review of your project to construct a new or modified source of air emissions. Please refer to Ecology Forms ECY 070-410a-g, "Instructions for NOC Application," for general information about completing the application.

Ecology offers up to two hours of free pre-application assistance. We encourage you to schedule a pre-application meeting with the contact person specified for the location of your proposal, below. If you use up your two hours of free pre-application assistance, we will continue to assist you after you submit Part 1 of the application and the application fee. You may schedule a meeting with us at any point in the process.

Upon completion of the application, please enclose a check for the initial fee and mail to:

Department of Ecology
Cashiering Unit
P.O. Box 47611
Olympia, WA 98504-7611

For Fiscal Office Use Only:
001-NSR-216-0299-000404

Check the box for the location of your proposal. For assistance, call the contact listed below:		
	Ecology Permitting Office	**Contact**
☐ **CRO**	**Chelan, Douglas, Kittitas, Klickitat, or Okanogan County** Ecology Central Regional Office – Air Quality Program	Lynnette Haller (509) 457-7126 lynnette.haller@ecy.wa.gov
☐ **ERO**	**Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Stevens, Walla Walla or Whitman County** Ecology Eastern Regional Office – Air Quality Program	Greg Flibbert (509) 329-3452 gregory.flibbert@ecy.wa.gov
☐ **NWRO**	**San Juan County** Ecology Northwest Regional Office – Air Quality Program	David Adler (425) 649-7082 david.adler@ecy.wa.gov
☐ **IND**	**For actions taken at Kraft and Sulfite Paper Mills and Aluminum Smelters** Ecology Industrial Section – Waste 2 Resources Program Permit manager: _____	Garin Schrieve (360) 407-6916 garin.schrieve@ecy.wa.gov
☒ **NWP**	**For actions taken on the US Department of Energy Hanford Reservation** Ecology Nuclear Waste Program	Philip Gent (509) 372-7983 philip.gent@ecy.wa.gov

DEPARTMENT OF ECOLOGY
State of Washington

Notice of Construction Application

Check the box below for the fee that applies to your application.

New project or equipment:

☒	**$1,500: Basic project** initial fee covers up to 16 hours of review.
☐	**$10,000: Complex project** initial fee covers up to 106 hours of review.

Change to an existing permit or equipment:

☐	**$200: Administrative or simple change** initial fee covers up to 3 hours of review Ecology may determine your change is complex during completeness review of your application. If your project is complex, you must pay the additional $675 before we will continue working on your application.
☐	**$875: Complex change** initial fee covers up to 10 hours of review
☐	**$350** flat fee: **Replace or alter control technology equipment under WAC 173-400-114** Ecology will contact you if we determine your change belongs in another fee category. You must pay the fee associated with that category before we will continue working on your application.

Read each statement, then check the box next to it to acknowledge that you agree.	
☒	The initial fee you submitted may not cover the cost of processing your application. Ecology will track the number of hours spent on your project. If the number of hours Ecology spends exceeds the hours included in your initial fee, Ecology will bill you $95 per hour for the extra time.
☒	You must include all information requested by this application. Ecology may not process your application if it does not include all the information requested.
☒	Submittal of this application allows Ecology staff to visit and inspect your facility.

DEPARTMENT OF ECOLOGY
State of Washington

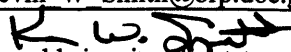
Notice of Construction Application

Part 1: General Information

I. Project, Facility, and Company Information

1. Project Name TOC-ENV-NOC-5269, Rev. 0, Criteria and Toxics Air Emissions Notice of Construction for the Hanford Site Standards Laboratory, 222-SL
2. Facility Name United States Department of Energy, Office of River Protection
3. Facility Street Address 2440 Stevens Drive, Richland, WA 99352
4. Facility Legal Description Hanford Site, 200 West Area
5. Company Legal Name (if different from Facility Name)
6. Company Mailing Address (street, city, state, zip) P.O. Box 550, MSIN H6-60, Richland, WA 99352

II. Contact Information and Certification

1. Facility Contact Name (who will be onsite) Dennis Bowser	
2. Facility Contact Mailing Address (if different than Company Mailing Address)	
3. Facility Contact Phone Number (509) 373-2566	4. Facility Contact E-mail Dennis_W_Bowser@orp.doe.gov
5. Billing Contact Name (who should receive billing information) Dennis Bowser	
6. Billing Contact Mailing Address (if different than Company Mailing Address)	
7. Billing Contact Phone Number (509) 373-2566	8. Billing Contact E-mail Dennis_W_Bowser@orp.doe.gov
9. Consultant Name (optional – if 3rd party hired to complete application elements)	
10. Consultant Organization/Company	
11. Consultant Mailing Address (street, city, state, zip)	
12. Consultant Phone Number	13.Consultant E-mail
14. Responsible Official Name and Title (who is responsible for project policy or decision-making) Kevin W. Smith, Manager	
16. Responsible Official Phone (509) 372-2315	17. Responsible Official E-mail Kevin_W_Smith@orp.doe.gov
18. Responsible Official Certification and Signature I certify, based on information and belief formed after reasonable inquiry, the statements and information in this application are true, accurate and complete.	 3/31/17

DEPARTMENT OF ECOLOGY
State of Washington

Notice of Construction Application

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10. Consultant Organization/Company	
11. Consultant Mailing Address (street, city, state, zip)	
12. Consultant Phone Number	13.Consultant E-mail
Signature _____ Date_____	

Part 2: Technical Information

The Technical Information may be sent with this application form to the Cashiering Unit, or may be sent directly to the Ecology regional office with jurisdiction along with a copy of this application form.

For all sections, check the box next to each item as you complete it.

III. Project Description

Please attach the following to your application.

☒ Written narrative describing your proposed project.
☒ Projected construction start and completion dates.
☒ Operating schedule and production rates.
☒ List of all major process equipment with manufacturer and maximum rated capacity.
☒ Process flow diagram with all emission points identified.
☒ Plan view site map.

☒ Manufacturer specification sheets for major process equipment components.
☒ Manufacturer specification sheets for pollution control equipment.
☒ Fuel specifications, including type, consumption (per hour & per year) and percent sulfur.

DEPARTMENT OF ECOLOGY
State of Washington

Notice of Construction Application

IV. State Environmental Policy Act (SEPA) Compliance

Check the appropriate box below.

☒ SEPA review is complete:
Include a copy of the final SEPA checklist and SEPA determination (e.g., DNS, MDNS, EIS) with your application.

☐ SEPA review has not been conducted:

☐ If review will be conducted by another agency, list the agency. You must provide a copy of the final SEPA checklist and SEPA determination before Ecology will issue your permit.
Agency Reviewing SEPA:

_____

☐ If the review will be conducted by Ecology, fill out a SEPA checklist and submit it with your application. You can find a SEPA checklist online at www.ecy.wa.gov/programs/sea/sepa/docs/echecklist.doc

DEPARTMENT OF ECOLOGY
State of Washington

Notice of Construction Application

V. Emissions Estimations of Criteria Pollutants

Does your project generate criteria air pollutant emissions? ☒ Yes ☐ No

If yes, please provide the following information regarding your criteria emissions in your application.

☒ The names of the criteria air pollutants emitted (i.e., NO_x, SO_2, CO, $PM_{2.5}$, PM_{10}, TSP, VOC, and Pb)

☒ Potential emissions of criteria air pollutants in tons per hour, tons per day, and tons per year (include calculations)

☐ If there will be any fugitive criteria pollutant emissions, clearly identify the pollutant and quantity

VI. Emissions Estimations of Toxic Air Pollutants

Does your project generate toxic air pollutant emissions? ☒ Yes ☐ No

If yes, please provide the following information regarding your toxic air pollutant emissions in your application.

☒ The names of the toxic air pollutants emitted (specified in WAC 173-460-150[1])

☒ Potential emissions of toxic air pollutants in pounds per hour, pounds per day, and pounds per year (include calculations)

☐ If there will be any fugitive toxic air pollutant emissions, clearly identify the pollutant and quantity

VII. Emission Standard Compliance

☐ Provide a list of all applicable new source performance standards, national emission standards for hazardous air pollutants, national emission standards for hazardous air pollutants for source categories, and emission standards adopted under Chapter 70.94 RCW.

Does your project comply with all applicable standards identified? ☒ Yes ☐ No

VIII. Best Available Control Technology

☒ Provide a complete evaluation of Best Available Control Technology (BACT) for your proposal.

IX. Ambient Air Impacts Analyses

Please provide the following:

☒ Ambient air impacts analyses for Criteria Air Pollutants (including fugitive emissions)

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[1] http://apps.leg.wa.gov/WAC/default.aspx?cite=173-460-150

DEPARTMENT OF ECOLOGY
State of Washington

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☒ Ambient air impacts analyses for Toxic Air Pollutants (including fugitive emissions)

☒ Discharge point data for each point included in air impacts analyses (include only if modeling is required)

- ☒ Exhaust height
- ☒ Exhaust inside dimensions (ex. diameter or length and width)
- ☒ Exhaust gas velocity or volumetric flow rate
- ☒ Exhaust gas exit temperature
- ☒ The volumetric flow rate
- ☒ Description of the discharges (i.e., vertically or horizontally) and whether there are any obstructions (ex., raincap)
- ☒ Identification of the emission unit(s) discharging from the point
- ☒ The distance from the stack to the nearest property line
- ☒ Emission unit building height, width, and length
- ☒ Height of tallest building on-site or in the vicinity and the nearest distance of that building to the exhaust
- ☒ Whether the facility is in an urban or rural location

Does your project cause or contribute to a violation of any ambient air quality standard or acceptable source impact level? ☐ Yes ☒ No

Attachment 3
17-ECD-0019
(1 Page Excluding Cover Sheet)

Notification of Off-Permit Change
Permit Number: 00-05-006, Renewal 2

NOTIFICATION OF OFF-PERMIT CHANGE

Permit Number: 00-05-006, Renewal 2

This notification is provided to the Washington State Department of Ecology, Washington State Department of Health, and the U.S. Environmental Protection Agency as a notice of an off-permit change described as follows.

The following changes are allowed pursuant to WAC 173-401-724(1), WAC 173-401-724(2), and WAC 173-401-724(6):

1. Change is not specifically addressed or prohibited by the AOP terms and conditions;
2. Change does not weaken the enforceability of the existing AOP conditions;
3. Change is not a Title I modification or subject to the acid rain requirements under Title IV of the FCAA;
4. Change meets all applicable requirements and does not violate an existing permit term or condition;
5. Change has complied with applicable preconstruction review requirements established pursuant to RCW 70.94.152.

Description of the change:
Upon approval of TOC-ENV-NOC-5269, "Criteria and Toxics Air Emissions Notice of Construction for the Ventilation System at the Hanford Site Laboratory, 222-SL," add a new discharge point and associated conditions to the Hanford Site Air Operating Permit, Attachment 1. Discharge Point: 222-SL Ventilation 200W Area - Ventilation
Date of change: (To be provided in the agency approval order.)
Will be provided in the agency approval order.
Describe the emissions resulting from the change:
Emission estimates are provided in TOC-ENV-NOC-5269.
Describe the new applicable requirements that will apply as a result of the change: (To be provided in the agency approval order.)
Will be provided in the agency approval order.